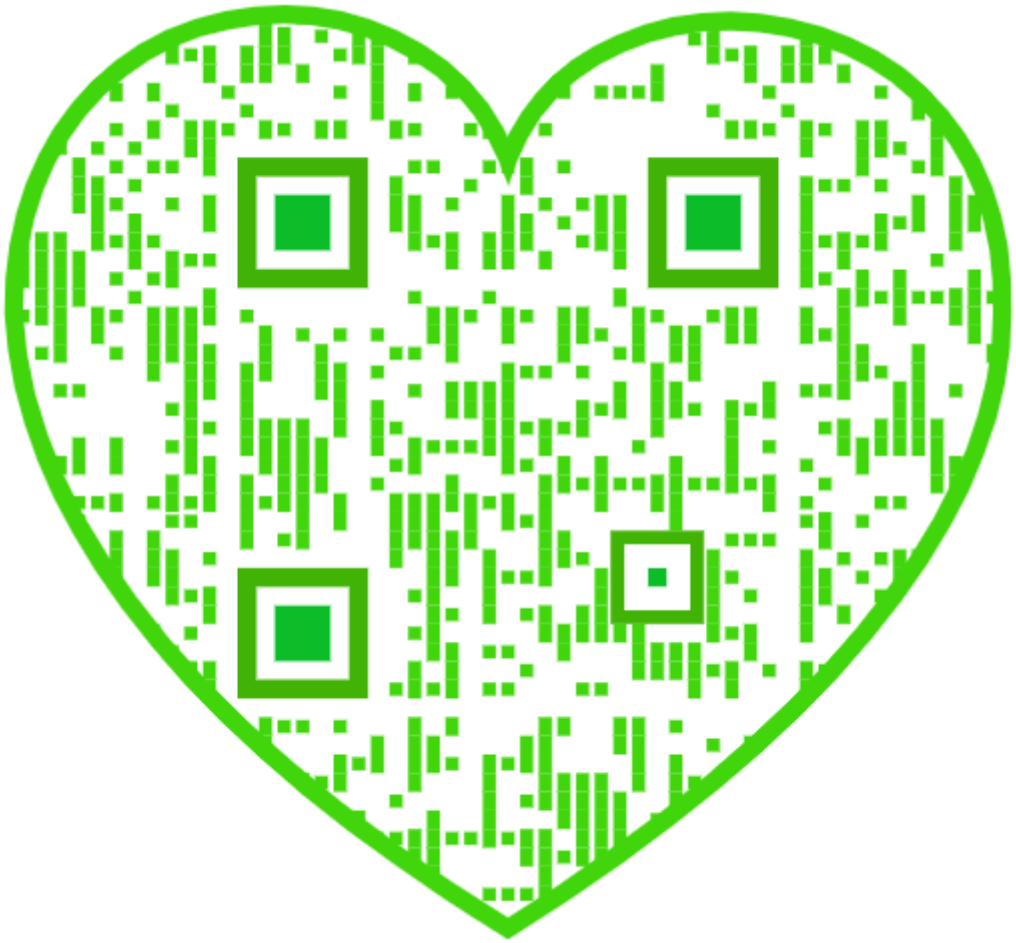
Master in Artificial Intelligence

Algorithm Selection & Development X



Purpose

The purpose of the section is to help you learn how to research, select, and develop appropriate algorithms to become a Successful Artificial Intelligence (AI) Engineer

At the end of this lecture, you will learn the following

- **Hyperparameter tuning**

Hyperparameter tuning

Process of finding the optimal values for these hyperparameters

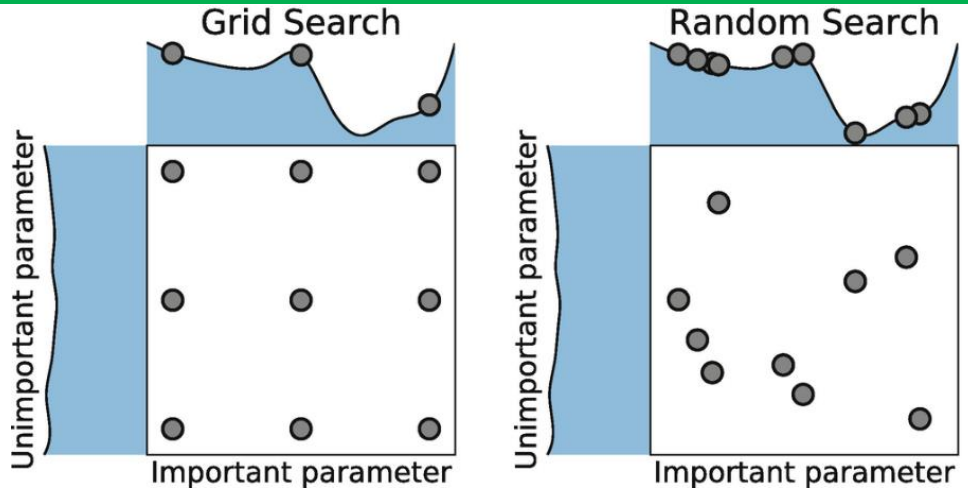
Systematically search

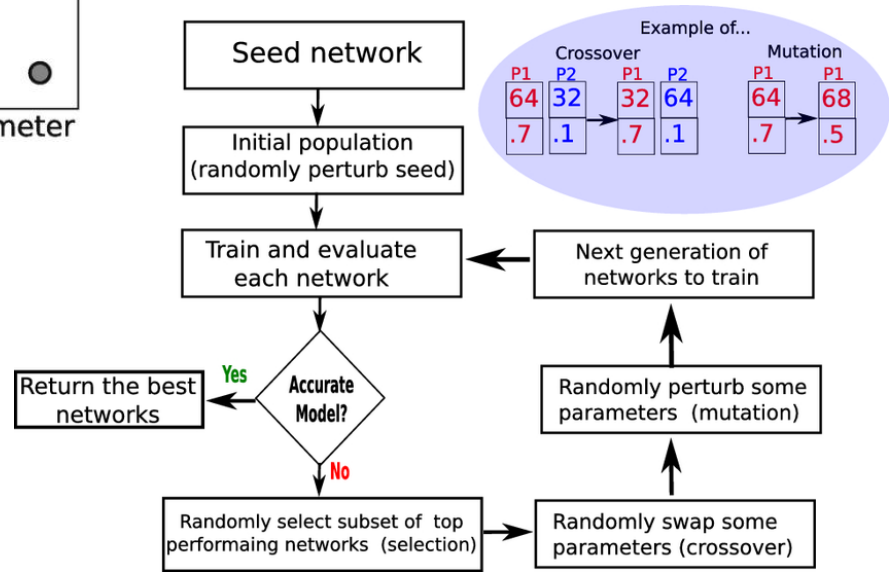
Techniques

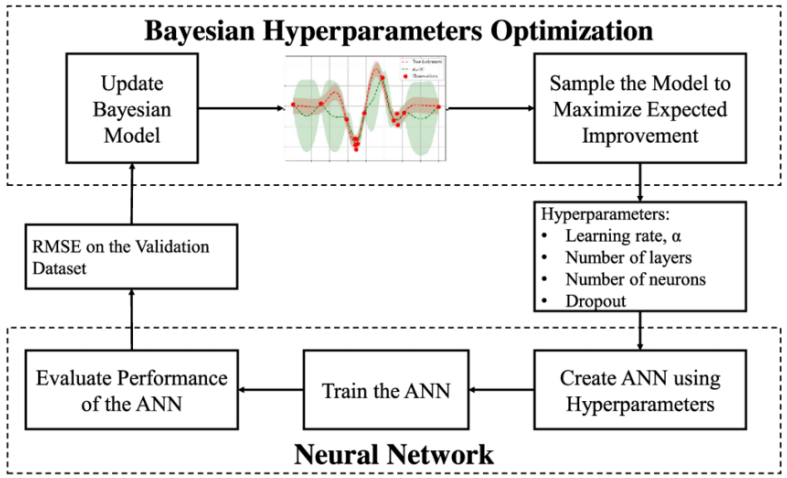
Model Performance Evaluation

How it helps

Techniques Hyperparameter tuning







What is Grid Search

Define Hyperparameter Grid

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Cross-Validation

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Grid Search

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Select Best Hyperparameters

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Optional: Evaluate on Test Set

What is Random Search

- Define Hyperparameter Ditributions
- Cross-Validation
- Random Sampling
- Model Training and Evaluation
- Select Best Hyperparameters
- Optional: Evaluate on Test Set

What is Bayesian optimization

Define Objective Function

Select Probabilistic Model

Initial Samples

Iterative Optimization

Convergence

Select Best Hyperparameters

What is Genetic algorithms

- Initialization
- Evaluation
- Selection
- Recombination (Crossover)
- Mutation
- Replacement
- Termination
- Solution Extraction

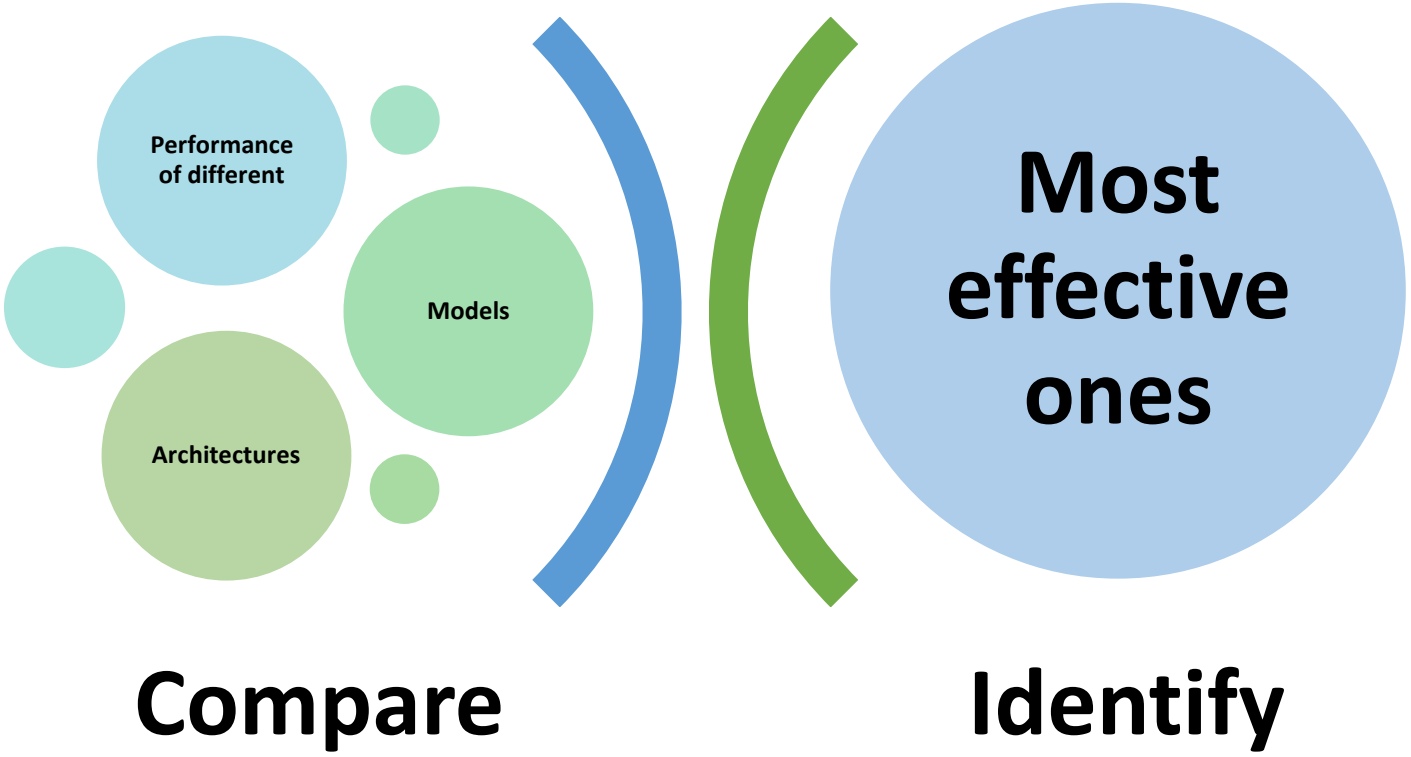
After Training and Evaluating multiple models, what is next in Model Selection and Evaluation

Multiple models

Using appropriate evaluation metrics and validation techniques

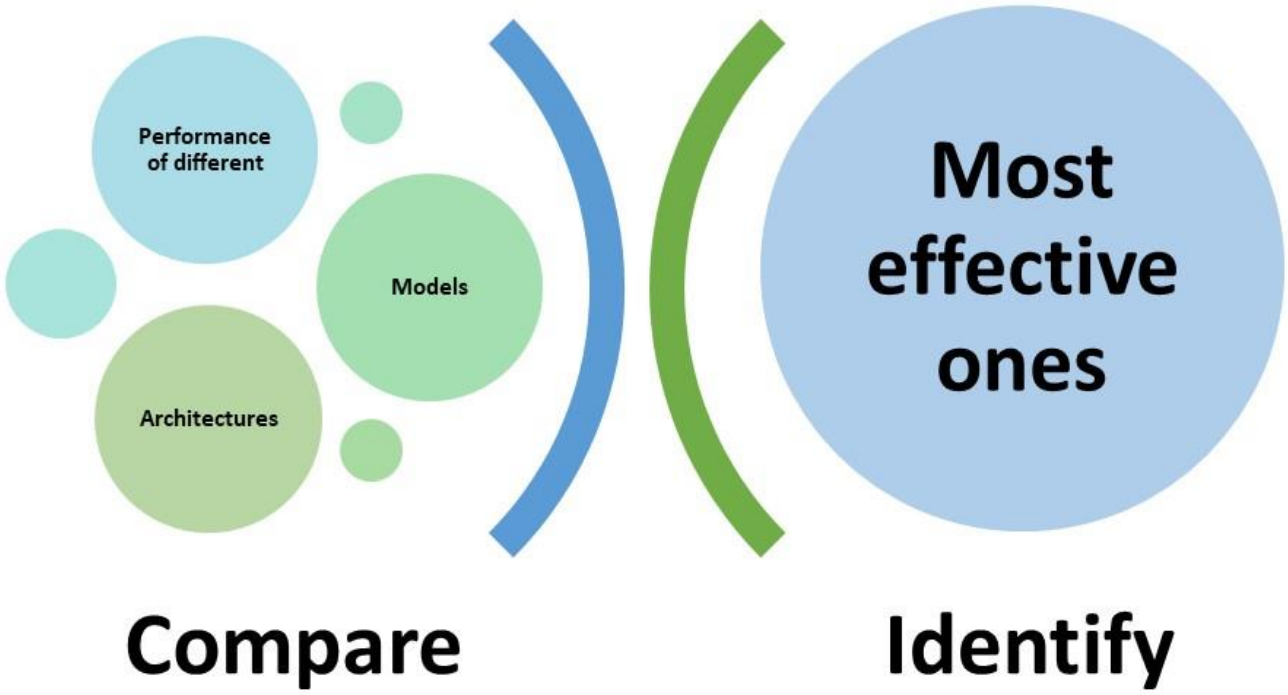
Cross-validation, hyperparameter tuning

Compare the performance of different models and architectures to identify the most effective ones



What is next?

How to compare the performance of different models and architectures to identify the most effective ones



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